ISE 529 Predictive Analytics
Spring 2023, Tuesday 12:30 – 3:20 PM; OHE 136

Instructor	Dr. Maryam Pishgar
Coordinates	email: pishgar@usc.edu, phone number: 9496560063
Office Hour	Tuesday 3:30-4:30PM or by appointment
Teaching Assistant	Gabriel Gu; email: minghaog@usc.edu
Office Hour	Monday 2:00-3:00PM
Required textbooks	1. Learning from Data (optional), by Yaser S. Abu-Mostafa, Malik Magdon-Ismail, and Hsuan-Tien, Lin (http://amlbook.com) 2. Machine Learning: A Probabilistic Perspective (optional), The MIT Press, by Kevin P. Murphy 3. Neural Networks and Deep Learning (optional): A Textbook, Springer, by Charu Aggarwal
Workload	• Roughly five homework sets for the semester • No late homework be accepted Start your homework assignments early
Examinations	Two projects
Grade Distribution	Homework 70%; projects 30%

Goals. The objective of this course is to learn fundamental methods of machine learning with focus on the practical implementations, and experimentation.
making.
Upon successful completion of this course, students will be able to:
• SLO1: Students will be able to demonstrate the different types of machine learning algorithms.
• SLO2: Students will be able to demonstrate the use of linear models for regression and classification estimations
• SLO3: Students will be able to recognize and explain why support vector machine (SVM) is a powerful and versatile machine learning model
• SLO4: Students will be able to implement end-to-end machine learning project
• SLO5: Students will be able to describe the main approaches for dimensionality reduction
• SLO6: Students will be able to analyze the impact of unsupervised learning models on real world application
• SLO7: Students will be able to identify the architectures of neural networks and implement basic deep learning networks

Tentative Schedule:
1. introduction
2. Introduction to machine learning and process mining
3. Linear, multivariate, polynomial, logistic, decision tree, Random Forest, support vector regression
4. KNN, SVM, decision tree, Random Forest, Naïve Bayes classification
5. neural network
6. deep learning
7. dimension reduction

8. principal component analysis
9. unsupervised learning and clustering